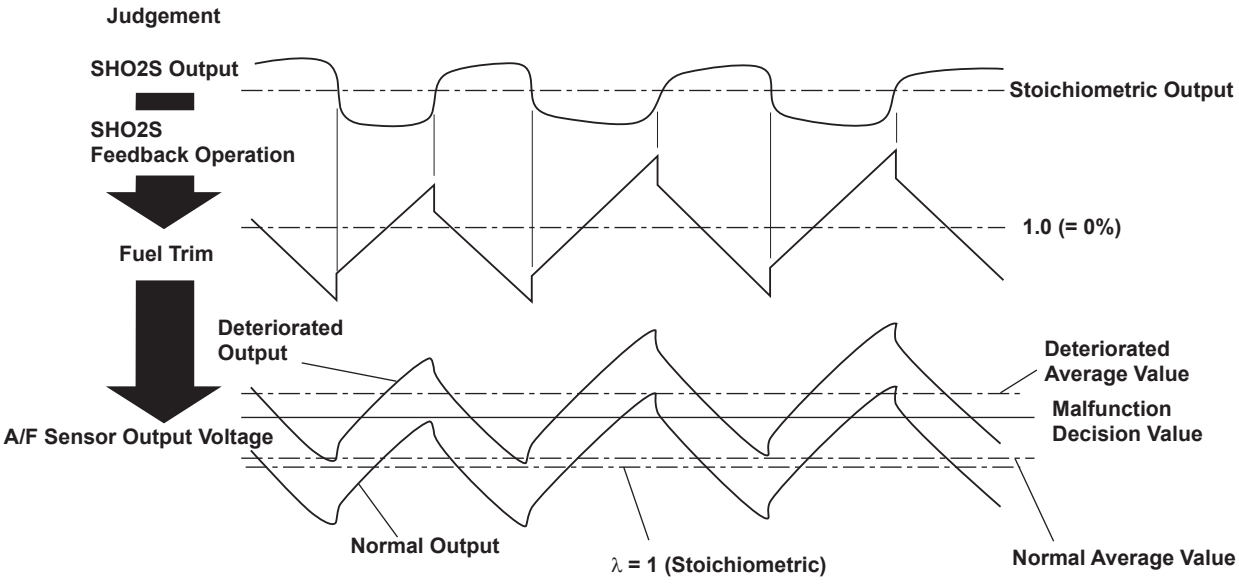
Advanced Diagnostics

DTC P1165: Air/Fuel Ratio (A/F) Sensor (Sensor 1) Range/Performance Problem



P1165-9871

General Description

The air/fuel ratio (A/F) sensor has a linear signal output in relation to the oxygen concentration. The engine control module (ECM)/powertrain control module (PCM) computes the air/fuel ratio from the A/F sensor output voltage and uses the fuel feedback control to improve exhaust emission. When implementing the A/F feedback control by means of secondary HO2S output, the average air/fuel ratio is optimized close to the stoichiometric ratio, though the inversion cycle is lengthened. Therefore, the average value of the A/F sensor output should be close to the stoichiometric ratio at the same time. If the A/F sensor output value is out of a specified range at this time a malfunction is detected and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Once per driving cycle
Sequence	None
Duration	15 seconds or more
DTC Type	Two drive cycles, MIL ON

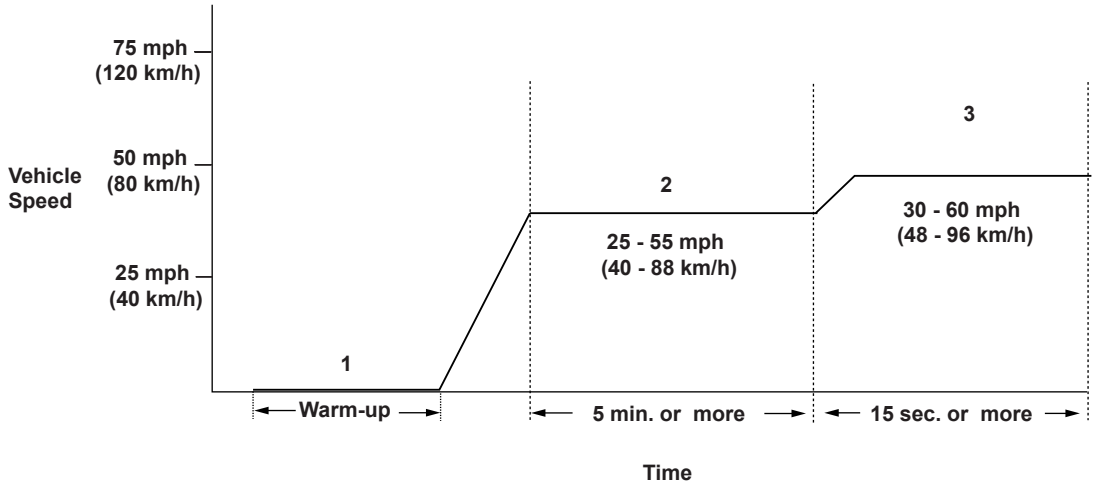
Enable Conditions

Condition		Minimum	Maximum
Engine coolant temperature		140ºF (60ºC)	212ºF (100ºC)
Intake air temperature		32ºF (0ºC)	—
Engine speed		1,250 rpm	2,500 rpm
MAP value	1,500 rpm	48 kPa (360 mmHg, 14.2 in.Hg)	81 kPa (610 mmHg, 24.0 in.Hg)
	2,500 rpm	23 kPa (172 mmHg, 6.8 in.Hg)	
Vehicle speed		30 mph (48 km/h)	62 mph (100 km/h)
Fuel trim		0.73	1.47
Fuel feedback		Closed loop at stoichiometric	
Monitoring priority		EVAP, Catalyst System, A/F Sensor	
No active DTCs		ECM/PCM, A/F Sensor, A/F Sensor Heater, Secondary HO2S, Secondary HO2S Heater, MAP, CKP, ECT, TP, CYP, IAT, EGR, BARO, VSS, VTEC System, Fuel System, Misfire	
Other		Other than when there is excessive vapor generation (fuel level is 40 - 80%)	

Malfunction Threshold

A mean time of two cycles of the A/F sensor output is out of the range from 1.039 to 0.961, or the mean time of six cycles of the A/F sensor output is out of the range from 1.055 to 0.945.

Driving Pattern



P0133-9850

1. Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed between 25 - 55 mph (40 - 88 km/h) for at least 5 minutes.
3. Then, drive immediately at a steady speed between 30 - 60 mph (48 - 96 km/h) for at least 15 seconds.

- If the EVAP monitor runs instead of the HO2S monitor, turn the engine off, then restart it, and the HO2S monitor will restart.
- If you have difficulty duplicating the DTC, retest after turning off electrical components such as the audio system and A/C, and try a different gear position.
- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.